Comments on:

"Input Linkages and the Transmission of Shocks: Firm-Level Evidence from the 2011 Tōhoku Earthquake"

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Recap

BFP use the 2011 Japan earthquake as an input supply shock:

1. Did supply chain disruptions have large impacts on US production?

   Yes; output falls 1-for-1 with imported inputs from Japan for US affiliates of Japanese multinationals.

2. How substitutable are inputs in global supply chains?

   Not very; firm-level production function $\approx$ Leontief in short run.

Many things to like:

- Ripped from the headlines.
- New data identifying multinational affiliates in the U.S.
- Combines reduced form and structural approaches.
- Attention to supply chains as conduits for shock transmission.

Plan for Discussion

1. Macro context: input elasticities are important for spillovers.

2. Is micro evidence from this episode generalizable?

3. What does micro evidence tell us about macro shock transmission?
   - Linking micro-level elasticities to macro elasticities
   - Missing ingredient: cascades via input chains

Macroeconomic Context

Why focus on input elasticities? The Rise of Global Supply Chains

Example: suppose Japanese Yen depreciates

- Since Japan is upstream in 'factory Asia', then devaluation boosts competitiveness of downstream Asian partners.
- But, there is expenditure switching toward Japanese inputs, reducing demand for inputs from downstream countries.
- Input switching effects are minimized if input elasticity is low.

General message: low input elasticity $\Rightarrow$ spillovers are reallocated away from supply chain partners, toward others. [Bems and Johnson (2014)].

Is micro evidence generalizable?

Is the shock informative for other episodes?

Shocks happen. Natural disaster was extreme, but not unique.

But, the type of shock – inputs not available at any price – is rare.

- No ability to substitute, then shut down production.
- Generally, if instead input prices rise, then production may fall, but far less dramatic (even with Leontief production).

Duration of shock was short, which dampened supplier switching:

> *"Our objective was to help the suppliers get back into production, not to re-source parts somewhere else."*
>
> *– General Motors executive [New York Times, 5/12/2011]*

Is micro evidence generalizable?

Is Japan's role in supply chains unusual?

Japan is upstream in autos and electronics.

Are Japanese multinational affiliates in the US mainly in autos?

Anecdotes focused mainly on autos; are they special?

> *"parts tend to be specific to particular vehicle models, in contrast to memory chips and microprocessors in the electronics industry and fabric and thread in the apparel industry . . . Suppliers are often the sole source for specific parts . . ."*
>
> – *Sturgeon, Memedovic, Van Biesebroeck, and Gereffi (2009)*

Linking micro evidence to macro shock transmission

Micro-to-Macro Elasticities

Does high frequency, micro rigidity translate into macro-rigidity?

Aggregating from micro elasticity to macro elasticity:

1. Aggregation over time: quarterly/annual elasticities mix intensive (fixed suppliers) and extensive (supplier switching) adjustment.
2. Aggregation across firms: macro elasticity combines within-firm substitution with cross-firm reallocation [Oberfield and Raval (2014)].

Linking micro evidence to macro shock transmission

Cascades via Input Chains

First-order-linkages: is the firm directly exposed to Japan?

Higher order linkages matter too.

- Across countries: e.g., Japanese inputs embodied in Korean semiconductors, which are exported to the US.
- Across firms: e.g., firm that directly imports from Japan may supply inputs to downstream firms in the US.

Key question: what is total exposure (direct + indirect) to the shock?

In Japan, downstream cascades hurt firms indirectly connected to suppliers in affected areas [Carvalho, Nirei, Saito, and Tahbaz-Saheli (2014)].

Final Remarks

Promising start on important questions regarding how shocks are transmitted via global supply chains.

More work is needed on:

- External validity/generalizability.
- Linking micro evidence to macro models.